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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/653,241	09/03/2003	Yoshihiro Ikeda	242246US2TTC	4731
22850	7590	04/05/2005	EXAMINER	
OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314			KIKNADZE, IRAKLI	
			ART UNIT	PAPER NUMBER
			2882	

DATE MAILED: 04/05/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/653,241

Applicant(s)

IKEDA ET AL.

Examiner

Irakli Kiknadze

Art Unit

2882

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 19 and 20 is/are allowed.
- 6) ☒ Claim(s) 1-6, 9-11, 14-17, 21 and 22 is/are rejected.
- 7) ☒ Claim(s) 7, 8, 12, 13 and 18 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner:
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-6, 9-11, 14-17, 21 and 22 are rejected under 35 U.S.C. 102(b) as being anticipated by Shinohara et al. (US Patent 6,188,744 B1).

With respect to claim 1, Shinohara teaches (Fig.1) an X-ray computer tomography apparatus (CT1), comprising:

an X-ray source (31) configured onto an object (P) to be examined; an X-ray detection unit (33) configured to detect X-rays transmitted through the object (P); a driving unit (3) configured to rotate at least one the X-ray source and the X-ray detection unit (33) around irradiate X-rays the object;

an image data generation unit (7) configured to generate image data basis of projection data using the X-ray detection unit (33); a ROI setting unit configured to set up a region of interest (ROI) in first image data from the image data generation unit, prior to injecting a contrast medium into the object (P);

a CT value calculating unit (11) configured to calculate computer tomography (CT) values in the region of interest being set in second image data from the image data generation unit, on the basis of positional information of the region of interest, the

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second image data being generated plural times after injecting the contrast medium into the object (P); and a CT value display unit configured to display changes of CT values with time calculated by the CT value calculating unit (column 3, lines 14-30, lines 50-61; column 4, lines 39-51; column 5, lines 4-15 and column 5, line 61- column 6, line 8).

With respect to claim 2, Shinohara teaches a threshold setting unit (Fig.3) configured to set at least one threshold value for the CT values and a CT value comparing unit configured to keep comparing the CT values calculated by the CT value calculating unit with the threshold value, and wherein the CT value display unit displays timing signal at which the CT values calculated by the CT value calculating unit become substantially equal to the threshold value set by the threshold setting unit (column 5, lines 16-30; column 6, lines 26-30).

With respect to claim 3, Shinohara teaches that the threshold value set by the threshold setting unit is a gradient of the changes of CT values with time (column 11, lines 57-60).

With respect to claim 4, Shinohara teaches an irradiation condition setting unit (221) configured to set a X-ray irradiation condition under which the X-ray source (31) irradiates X-rays onto the object, wherein the irradiation condition setting unit modifies the X-ray irradiation condition during generation of the second image data (column 10, lines 7-17).

With respect to claim 5, Shinohara teaches a computer tomography apparatus comprising:

an x-ray source (31) configured to irradiate X-rays into an object (P) examined;
an X-ray detection unit (33) configured to detect X-rays transmitted through the object (P);

a driving unit (3) configured to rotate at least one of the X-ray source (31) and the X-ray detection (33) unit around the object (P);

an image data generation unit (7) configured to generate image data on the basis of projection data using the X-ray detection unit (33);

a ROI setting unit configured to set up a region interest in the first image data from the image data generation unit, prior injecting contrast medium setting unit into the object;

CT value calculating unit (11) configured to calculate CT value in the region of interest being set in second image data from the image data generation unit (7), on the basis of positional information of the region of interest, second image data being generated plural times, after injecting contrast medium into object; a threshold setting unit configured to set at least one threshold value for the CT values;

CT value comparing unit configured keep comparing the CT values calculated by the CT value calculating unit with the threshold value set by the threshold setting unit and to generate a coincidence signal when both substantially agree; and

an irradiation condition setting unit configured to set conditions of the X-ray irradiation on the basis of an output signal from the CT value comparing unit (column 3, lines 14-30, lines 50-61; column 4, lines 39-51; column 5, lines 4-30 and column 5, line 61- column 6, line 8; column 11, lines 57-60).

With respect to claim 6, Shinohara teaches the irradiation condition setting unit sets a first irradiation condition under which low-dose X-rays are irradiated and second irradiation condition under which high-dose X-rays are irradiated (column 4, lines 39-51).

With respect to claim 9, Shinohara teaches that the ROI setting unit sets plural regions of interest in first image data distinguishably, and wherein said CT value display unit displays changes of the CT values with time obtained in the regions of interest in a corresponding manner to the regions of interest (column 5, lines 4-30 and column 5, line 61- column 6, line 8).

With respect to claim 10, Shinohara teaches that the ROI setting unit resets the region of interest using the second image data (column 12, lines 22-30).

With respect to claim 11, Shinohara teaches the CT value calculating unit calculates plural CT values, in pixels, in the region of interest of image data set by the ROI setting unit and takes maximum value of the calculated CT values as a typical CT value of the region of interest (column 7, lines 49-54).

With respect to claim 14, Shinohara teaches that the CT value display unit displays changes of difference with time between the CT values in regions of interest of the second image data and the CT values in regions of interest of the first image data (column 8, lines 5-20).

With respect to claim 15, Shinohara teaches an image data storage unit (11), and wherein the CT value calculating unit calculates CT values in regions of interest newly set by the ROI setting unit in the second image data stored in the image data storage

unit, and wherein the CT value display unit displays changes of CT values with time in the regions of interest retrospectively (column 7, lines 44-48).

With respect to claim 16, Shinohara teaches an image data display unit (13), and wherein the image data display unit separately displays the second image data and the second image data to which boundary lines of the regions of interest are attached (column 10, lines 35-49).

With respect to claim 17, Shinohara teaches an X-ray computer tomography apparatus comprising: an X-ray source (31) configured to irradiate X-rays into an object (P) to be examined; an X-ray detection unit (33) configured to detect X-rays transmitted through the object (P); a moving unit (5) configured to move the object in a given direction; an image data generation unit (7) configured to generate image data on the basis of projection data from the object collected from the X-ray detection unit (33) plural times, while moving the object by the moving unit (5); a ROI setting unit configured to set at least one region of interest in the image data which is obtained by the image data generation unit; and a CT value calculating unit configured to calculate CT values in the region of interest being set in the image data which is obtained by the image data generation unit, while generating the image data by the image data generation unit (column 3, lines 14-30, lines 39-61; column 4, lines 39-51; column 5, lines 4-30 and column 5, line 61- column 6, line 8; column 11, lines 57-60).

With respect to claim 21, Shinohara teaches a method of measuring CT values, comprising: generating first image data which is obtained by an X-ray detection unit (33) with respect to a position of a object (P) to be examined, prior to injecting a contrast

medium into the object (P); setting a region of interest in the first image data for calculating CT values; generating second image data which is obtained by the X-ray detection unit plural times after injecting the contrast medium into the object (P); calculating CT values in the region of interest being set in the second image data on the basis of positional information of the region of interest set by the setting step, while generating second image data; and displaying changes of the CT values with time which is obtained by the calculation (column 3, lines 14-30, lines 50-61; column 4, lines 39-51; column 5, lines 4-15 and column 5, line 61- column 6, line 8).

With respect to claim 22, Shinohara teaches a method of measuring CT values, comprising: setting a region of interest for image data; generating image data on the basis of projection data collected by using an X-ray source (31) and an X-ray detection unit (33) around an object (P) to be examined plural times, while moving the object in a given direction by a moving unit (5); calculating CT values in the region of interest being set in the image data on the basis of positional information of the region of interest set by the setting step, while generating the image data; and ending scanning on the basis of the calculated CT values (Fig.4).

Allowable Subject Matter

3. Claims 7, 8, 12, 13 and 18 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

4. Claims 19 and 20 are allowed.

5. The following is a statement of reasons for the indication of allowable subject matter:

With respect to claim 7 and 8, the prior art fails to teach or make obvious an X-ray computer tomography apparatus comprising the irradiation condition setting unit setting irradiation conditions for third scanning under the first irradiation condition during generation of the second image data as claimed in claim 7.

With respect to claim 12 and 13, the prior art fails to teach or make obvious an X-ray computer tomography apparatus comprising the ROI setting unit attaching an identifiable index to the region of interest in at least one of blood vessels at which a contrast medium arrives earliest and latest, respectively as claimed in claim 12.

With respect to claim 18, the prior art fails to teach or make obvious an X-ray computer tomography apparatus comprising a threshold setting unit configured to set threshold values for CT values and a CT value comparing unit configured to keep comparing CT values obtained by the CT value calculating unit with the threshold values set by the threshold setting unit and to generate an instruction signal for stopping X-ray irradiation when both substantially agree as claimed.

With respect to claims 19 and 20, the prior art fails to teach or make obvious an X-ray computer tomography apparatus comprising a pixel number comparing unit configured to keep comparing the number of pixels obtained by a pixel number measuring unit the threshold value of the number of pixels set by the threshold setting unit and to generate an instruction signal for stopping X-ray irradiation when both substantially agree as claimed.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Ozaki (US Patent 5,987,093), Nambu et al. (US Patent 5,412,562) and Nemoto (US Patent Application Publication US 2002/0054038 A1) teach the methods and apparatus for calculating CT values in the region of interest.


7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Irakli Kiknadze whose telephone number is 571-272-2493. The examiner can normally be reached on 9:00- 5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ed Glick can be reached on 571-272-2490. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Irakli Kiknadze
April 4, 2005

IK


EDWARD J. GLICK
SUPERVISORY PATENT EXAMINER